

## APPARATUS AND METHODS FOR IMAGING WELLS DRILLED WITH OIL-BASED MUDS

### **Abstract**

A resistivity logging sensor for logging while drilling a well using an oil-based mud includes a sensor body; a first current injector electrode disposed on the sensor body, wherein the first current injector electrode is electrically insulated from the sensor body; at least two current return electrodes disposed on the sensor body at a selected distance from the first current injector electrode, wherein the at least two current return electrodes are disposed proximate to each other and are electrically insulated from the sensor body; and an electrical source configured to energize the first current injector electrode with a current having a voltage of no less than 50 mvolts and a frequency of no less than 1 KHz.